25. (New) The device of Claim 18 in which the tissue engaging surface and slot each have a width and the width of the slot is less than or equal to 1/3 the width of the tissue engaging surface.

26. (New) The device of Claim 20 in which the portion of the conductive member extending through the slot and the tissue engaging surface each has a width and the width of the conductive member portion is less than or equal to 1/3 the width of the tissue engaging surface.

REMARKS

Claims 1-26 are pending in this application. Claims 1 and 4 are independent. Original Claims 1-6 were rejected under 35 U.S.C. 103 as obvious in view of U.S. Patent No. 6,071,281 to Burnside.

By the present amendment, the claims have been amended to make clear that they are directed to ablation apparatus for forming transmural lesions in cardiac tissue. As set forth in the claims, the present invention includes first and second jaws moveable between an open position to receive cardiac tissue therebetween and a closed or clamping position compressing the tissue located between the jaws. Of particular note is that each jaw carries an elongated electrically conductive member which has a width less than or equal to about one-third the width of the respective jaws. The conductive members may be connected to an RF energy source to

direct current through the clamped tissue to form transmural lesions or lines of ablation through the clamped tissue.

This structure is unlike anything shown or suggested in the Burnside '281 patent. The clamping device disclosed in Burnside (see Figures 78-88, and the features cited in the Office Action) is not for forming transmural lesions, but for cauterizing and welding tissue together, as in welding together opposed walls of the atrial appendage. The device in Burnside employs wide electrodes to achieve large thermal spread. For example, the device in Figures 78-80 of Burnside employs spaced intermittent electrodes 294 that are basically as wide as the jaw itself. The device in Figure 88 uses a recessed electrode that is fully one-half the width of the jaw.

The relative width of the conductive element and the jaw is not merely a matter of design choice. An important difference, as pointed out above, is that the present invention is a device for forming transmural ablation lines or lesions in cardiac tissue. In one application, opposed walls of the human heart atrium are compressed together and a transmural lesion is formed through both walls simultaneously, without sealing the walls together. Thus, the claimed apparatus here has structure and function that are basically the opposite of the Burnside clamp. The relative size of the conductive element and jaw as expressed in the present claim allows blood or other fluid to be expressed from between the walls of the atrium or the like when the clamp is applied, and reduces

the opportunity for undesirable thermal spread or coagulation of the blood or other liquid or inadvertent welding of opposed walls together. This is not disclosed or suggested in Burnside.

Moreover, before one skilled in the art can appreciate the benefit of this relatively sizing, however, he/she also needs to appreciate the application to which the present invention is directed -- i.e., the formation of elongated, narrow lesion lines in cardiac tissue using an RF power source with limited injury to adjoining tissue, including the simultaneously forming ablation lines in opposed walls of the atrium with RF energy without sealing the opposed walls together. So, to render the claimed invention obvious requires at least a two-step thought process, neither step of which is taught or suggested by the prior art.

Finally, a further distinction from the Burnside patent may be seen in Burnside's use of a plurality of spaced-apart electrodes, in contrast to the thin elongated conductive members of the claimed invention. Even with improper use of hindsight gained from the present application, the device of Burnside simply is not suitable to achieve the elongated thin transmural lesion lines in cardiac tissue that do not weld the tissue together achieved by the present invention.

For all of the above reasons, it is respectfully requested that the pending claims, as amended, be reconsidered and allowed.

Respectfully submitted,

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MARKED-UP VERSION OF CLAIMS TO SHOW CHANGES

1. A device for clamping and ablating cardiac tissue to form a transmural lesion therein, comprising:

a first handle member;

a second handle member;

first and second mating jaw members associated with the first and second handle members, respectively, the jaw members being movable by the handle members between a first open position to receive tissue therebetween and a second clamped position compressing the tissue, the jaw members having outer surfaces with opposed mating surfaces, each mating surface having a width ~~jaw~~;

a first elongated ~~electrode extending along the length of~~ electrically conductive member carried by the first jaw member;

a second elongated ~~electrode extending along the length of~~ electrically conductive member carried by the second jaw member;

the first and second ~~electrodes~~ conductive members each having a width of less than or equal to one-third the width of its associated mating surface and being adapted to be connected to an RF energy source so that, when activated, the first and second ~~electrodes are of opposite polarity~~ conductive members conduct electrical current through tissue clamped between the jaw members.

2. The device of claim 1 wherein the ~~electrodes~~ conductive members are less than or equal to 1.25mm in width.

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3. The device of claim 2 wherein the ~~electrodes~~ conductive members are between approximately 0.12 to 0.6 mm in width.

4. A tissue grasping apparatus for forming a transmural lesion in cardiac tissue, comprising:

first and second grasping jaws, the grasping jaws being relatively moveable between open and closed positions, respectively, to receive and compress tissue therebetween; each jaw having a width including an elongated ~~electrode~~ electrically conductive member and a clamping surface in face-to-face relation with the ~~electrode~~ electrically conductive member and clamping surface of the other jaw; the face-to-face electrodes being ~~of opposite polarity and~~ connectible to ~~a~~ RF energy power source for providing an electrical current ~~between the electrodes~~ through tissue clamped between the jaws, the electrodes having a width of less than or equal to one-third the width of its associated jaw.

5. The apparatus of claim 4 wherein the ~~electrodes~~ electrically conductive members are less than or equal to 1.25 mm in width.

6. The apparatus of claim 5 wherein the ~~electrodes~~ electrically conductive members are between approximately 0.12 to 0.6 mm in width.

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